

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

21. (Currently amended) A method for manufacturing a semiconductor device comprising the steps of:

- forming a non-single crystalline semiconductor film on an insulating surface;
- ~~directing~~ introducing ions of an element which is inert with respect to said semiconductor film into a selected portion of said semiconductor film using a first mask covering a first portion of said semiconductor film provided over said semiconductor film;
- disposing a crystallization promoting material in contact with said semiconductor film;
- crystallizing said semiconductor film by heating wherein said crystallization promoting material segregates in said selected region during the crystallization; ~~and~~
- ~~forming an active region of said semiconductor device by removing at least said selected region by etching.~~
- forming a second mask over said semiconductor film; and
- etching a part of said first portion of said semiconductor film and said selected portion of said semiconductor film using said second mask after said heating to form an active layer of said semiconductor device.

25. (Currently amended) A method for manufacturing a semiconductor device comprising the steps of:

- forming a non-single crystalline semiconductor film on an insulating surface provided over a quartz substrate;
- ~~directing~~ introducing ions of an element which is inert with respect to said semiconductor film into a selected portion of said semiconductor substrate using a first mask covering a first portion of said semiconductor film provided over said semiconductor film;

disposing a crystallization promoting material in contact with said semiconductor film;  
crystallizing said semiconductor film by heating at a temperature of 800 to 1100 °C  
wherein said crystallization promoting material segregates in said selected region during the  
crystallizing; and

~~forming an active region of said semiconductor device by removing at least said selected  
region by etching.~~

forming a second mask over said semiconductor film; and

etching a part of said first portion of said semiconductor film and said selected portion of  
said semiconductor film using said second mask after said heating to form an active layer of said  
semiconductor device.

37. (Currently amended) A method for manufacturing a semiconductor device  
comprising:

providing a semiconductor film with a crystallization promoting material;

introducing phosphorus into a selected portion of said semiconductor film using a first  
mask covering a first portion of said semiconductor film provided over said semiconductor film;

crystallizing said semiconductor film with said selected region of said semiconductor  
film containing said phosphorus to getter said crystallization promoting material during said  
crystallizing; and

~~removing at least said selected region of said semiconductor film.~~

forming a second mask over said semiconductor film; and

etching a part of said first portion of said semiconductor film and said selected portion of  
said semiconductor film using said second mask after said heating to form an active layer of said  
semiconductor device.

38. (Currently amended) A method for manufacturing a semiconductor device  
comprising:

providing a semiconductor film with a crystallization promoting material;

introducing phosphorus into a selected portion of said semiconductor film using a first mask covering a first portion of said semiconductor film provided over said semiconductor film;

crystallizing said semiconductor film by heating with said selected region of said semiconductor film containing said phosphorus to getter said crystallization promoting material during said crystallizing; ~~and~~

~~removing at least said selected region of said semiconductor film;~~

forming a second mask over said semiconductor film; and

etching a part of said first portion of said semiconductor film and said selected portion of said semiconductor film using said second mask after said heating to form an active layer of said semiconductor device.

39. (Currently amended) A method for manufacturing a semiconductor device comprising:

providing a semiconductor film with a crystallization promoting material;

introducing phosphorus into a selected portion of said semiconductor film using a first mask covering a first portion of said semiconductor film provided over said semiconductor film;

crystallizing said semiconductor film with said selected region of said semiconductor film containing said phosphorus to getter said crystallization promoting material during said crystallizing; ~~and~~

~~removing at least said selected region of said semiconductor film to form a crystalline semiconductor island to become at least a channel forming region.~~

forming a second mask over said semiconductor film; and

etching a part of said first portion of said semiconductor film and said selected portion of said semiconductor film using said second mask after said heating to form an active layer of said semiconductor device.

40. (Previously presented) The method of claim 37 wherein said gettering of said crystallization promoting material is caused by a gettering effect of said phosphorus.

41. (Previously presented) The method of claim 38 wherein said gettering of said crystallization promoting material is caused by a gettering effect of said phosphorus.

42. (Previously presented) The method of claim 39 wherein said gettering of said crystallization promoting material is caused by a gettering effect of said phosphorus.

43. (Previously presented) The method of claim 37 wherein said semiconductor film comprises silicon.

44. The method of claim 38 wherein said semiconductor film comprises silicon.

45. (Previously presented) The method of claim 39 wherein said semiconductor film comprises silicon.

46. (Previously presented) The method of claim 37 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

47. (Previously presented) The method of claim 38 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

48. (Previously presented) The method of claim 39 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

49. (Currently amended) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising silicon over a substrate;  
providing said semiconductor film with a crystallization promoting material;  
introducing an argon ion into a selected portion of said semiconductor film using a first mask covering a first portion of said semiconductor film provided over said semiconductor film;  
heating said semiconductor film to getter said crystallization promoting material into said selected portion of said semiconductor film;  
forming a second mask over said semiconductor film; and  
etching a part of said first portion of said semiconductor film and said selected portion of said semiconductor film using said second mask after said heating to form an active layer of said semiconductor device.

50. (Currently amended) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising silicon over a substrate;  
providing said semiconductor film with a crystallization promoting material;  
introducing an argon ion into a selected portion of said semiconductor film using a first mask covering a first portion of said semiconductor film provided over said semiconductor film;  
heating said semiconductor film to crystallize said semiconductor film using said crystallization promoting material and to getter said crystallization promoting material into said selected portion of said semiconductor film;  
forming a second mask over said semiconductor film; and  
etching a part of said first portion of said semiconductor film and said selected portion of said semiconductor film using said second mask after said heating to form an active layer of said semiconductor device.

51. (Currently amended) A method for manufacturing a semiconductor device comprising:

forming a semiconductor island comprising silicon over a substrate;

providing said semiconductor island with a crystallization promoting material;  
introducing an argon ion into a selected portion of said semiconductor island;  
heating said semiconductor island to getter said crystallization promoting material into  
said selected portion of said semiconductor island;

removing said selected portion of said semiconductor island and a part of said  
semiconductor island adjacent to said selected portion in order to form an active layer of said  
semiconductor device.

52. (Currently amended) A method for manufacturing a semiconductor device  
comprising:

forming a semiconductor island comprising silicon over a substrate;  
providing said semiconductor island with a crystallization promoting material;  
introducing an argon ion into a selected portion of said semiconductor island;  
heating said semiconductor island to crystallize said semiconductor island using said  
crystallization promoting material and to getter said crystallization promoting material into said  
selected portion of said semiconductor island;

removing said selected portion of said semiconductor island and a part of said  
semiconductor island adjacent to said selected portion in order to form an active layer of said  
semiconductor device.

53. (Currently amended) A method for manufacturing a semiconductor device  
comprising:

forming a semiconductor film comprising silicon over a substrate;  
providing said semiconductor film with a crystallization promoting material;  
introducing an argon ion into a selected portion of said semiconductor film using a mask  
provided over said semiconductor film;

heating said semiconductor film to getter said crystallization promoting material into said  
selected portion of said semiconductor film; and

etching said selected portion of said semiconductor film and a part of said semiconductor film covered with said mask in said introducing step after said heating to form an active layer of the semiconductor device,

wherein said part of said semiconductor film covered with said mask in said introducing step is adjacent to said selected portion.

54. (Currently amended) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising silicon over a substrate;

providing said semiconductor film with a crystallization promoting material;

introducing an argon ion into a selected portion of said semiconductor film using a mask provided over said semiconductor film;

heating said semiconductor film to crystallize said semiconductor film using said crystallization promoting material and to getter said crystallization promoting material into said selected portion of said semiconductor film; and

etching said selected portion of said semiconductor film and a part of said semiconductor film covered with said mask in said introducing step after said heating to form an active layer of the semiconductor device,

wherein said part of said semiconductor film covered with said mask in said introducing step is adjacent to said selected portion.

55. (Previously presented) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising silicon over a substrate;

providing said semiconductor film with a crystallization promoting material;

introducing an argon ion into a selected portion of said semiconductor film using a first mask covering a first portion of said semiconductor film provided over said semiconductor film;

heating said semiconductor film to getter said crystallization promoting material into said selected portion of said semiconductor film;

forming a second mask over said semiconductor film;

etching a part of said first portion of said semiconductor film and said selected portion of said semiconductor film using said second mask after said heating to form an active layer of the semiconductor device.

56. (Previously presented) A method for manufacturing a semiconductor device comprising:

forming a semiconductor film comprising silicon over a substrate;

providing said semiconductor film with a crystallization promoting material;

introducing an argon ion into a selected portion of said semiconductor film using a first mask covering a first portion of said semiconductor film provided over said semiconductor film;

heating said semiconductor film to crystallize said semiconductor film using said crystallization promoting material and to getter said crystallization promoting material into said selected portion of said semiconductor film;

forming a second mask over said semiconductor film;

etching a part of said first portion of said semiconductor film and said selected portion of said semiconductor film using said second mask after said heating to form an active layer of the semiconductor device.

57. (Previously presented) The method of claim 49 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

58. (Previously presented) The method of claim 50 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.



59. (Previously presented) The method of claim 51 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

60. (Previously presented) The method of claim 52 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

61. (Previously presented) The method of claim 53 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

62. (Previously presented) The method of claim 54 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

63. (Previously presented) The method of claim 55 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

64. (Previously presented) The method of claim 56 wherein said crystallization promoting material comprises an element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

65. (Previously presented) The method of claim 49 further comprising the step of etching said selected portion of said semiconductor film.

66. (Previously presented) The method of claim 50 further comprising the step of etching said selected portion of said semiconductor film.

67. (Previously presented) The method of claim 51 further comprising the step of etching said selected portion of said semiconductor island.

68. (Previously presented) The method of claim 52 further comprising the step of etching said selected portion of said semiconductor island.

69. (Previously presented) The method of claim 53 wherein said semiconductor film is formed into a semiconductor island.

70. (Previously presented) The method of claim 54 wherein said semiconductor film is formed into a semiconductor island.

71. (Previously presented) The method of claim 55 wherein said semiconductor film is formed into a semiconductor island.

72. (Previously presented) The method of claim 56 wherein said semiconductor film is formed into a semiconductor island.

73. (Previously presented) The method of claim 49 wherein said semiconductor film comprises an amorphous silicon.

74. (Previously presented) The method of claim 50 wherein said semiconductor film comprises an amorphous silicon.

75. (Previously presented) The method of claim 51 wherein said semiconductor island comprises an amorphous silicon.

76. (Previously presented) The method of claim 52 wherein said semiconductor island comprises an amorphous silicon.

77. (Previously presented) The method of claim 53 wherein said semiconductor film comprises an amorphous silicon.

78. (Previously presented) The method of claim 54 wherein said semiconductor film comprises an amorphous silicon.

79. (Previously presented) The method of claim 55 wherein said semiconductor film comprises an amorphous silicon.

80. (Previously presented) The method of claim 56 wherein said semiconductor film comprises an amorphous silicon.

81. (Previously presented) The method of claim 49 wherein said heating is conducted at a temperature of 450 to 700 °C.

82. (Previously presented) The method of claim 50 wherein said heating is conducted at a temperature of 450 to 700 °C.

83. (Previously presented) The method of claim 51 wherein said heating is conducted at a temperature of 450 to 700 °C.

84. (Previously presented) The method of claim 52 wherein said heating is conducted at a temperature of 450 to 700 °C.

85. (Previously presented) The method of claim 53 wherein said heating is conducted at a temperature of 450 to 700 °C.

86. (Previously presented) The method of claim 54 wherein said heating is conducted at a temperature of 450 to 700 °C.

87. (Previously presented) The method of claim 55 wherein said heating is conducted at a temperature of 450 to 700 °C.

88. (Previously presented) The method of claim 56 wherein said heating is conducted at a temperature of 450 to 700 °C.

89. (Previously presented) The method of claim 49 wherein said heating is conducted at a temperature of 800 to 1100 °C.

90. (Previously presented) The method of claim 50 wherein said heating is conducted at a temperature of 800 to 1100 °C.

91. (Previously presented) The method of claim 51 wherein said heating is conducted at a temperature of 800 to 1100 °C.

92. (Previously presented) The method of claim 52 wherein said heating is conducted at a temperature of 800 to 1100 °C.

93. (Previously presented) The method of claim 53 wherein said heating is conducted at a temperature of 800 to 1100 °C.

94. (Previously presented) The method of claim 54 wherein said heating is conducted at a temperature of 800 to 1100 °C.

95. (Previously presented) The method of claim 55 wherein said heating is conducted at a temperature of 800 to 1100 °C.

96. (Previously presented) The method of claim 56 wherein said heating is conducted at a temperature of 800 to 1100 °C.

97. (New) A method according to claim 21, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.

98. (New) A method according to claim 25, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.

99. (New) A method according to claim 37, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.

100. (New) A method according to claim 38, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.

101. (New) A method according to claim 39, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.

102. (New) A method according to claim 49, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.

103. (New) A method according to claim 50, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.

104. (New) A method according to claim 55, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.

105. (New) A method according to claim 56, wherein a width of said second mask is smaller than that of said first mask in a longer direction of said semiconductor film.